



Warm Springs Fish Technology Center

March/April 2011 Activity Report

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Roman Crumpton (Bears Bluff National Fish Hatchery) and William Wayman collect sperm from an American shad for cryopreservation studies. Credit: USFWS Photo.

Warm Springs Fish Technology Center

The Fish Technology Center (FTC) is a component of the Warm Springs Regional Fisheries Center (RFC) and was developed to improve and enhance fisheries management. We provide consolidated technical operational support to regional fisheries operations and technical assistance to the public. The Fish Technology Center is comprised of a cryopreservation laboratory, conservation genetics laboratory, and the National Fish Strain Registry at Warm Springs, Georgia, and a field station in Wadmalaw Island, South Carolina.

Goals:

- Provide management support of interjurisdictional coastal and riverine fishes such as robust redhorse, shortnose sturgeon, Atlantic sturgeon, Gulf sturgeon, American shad, and Gulf striped bass.
- Provide conservation genetics support for regional fishery programs.
- Maintain the National Fish Strain Registry for dissemination of information and support of private, state and federal broodstocks.
- Develop cryopreservation techniques for imperiled fish, freshwater mussels, and amphibians.
- Develop hatchery product evaluation techniques.

Cryopreservation

Cryopreservation is a process in which a living cell is frozen, stored, and thawed and remains viable. Cryopreserved sperm assists reproductive efforts by allowing spawning to take place whenever females are ready, reduces the need to hold males, and can increase flexibility and genetic diversity in spawning protocols.

Currently, the Warm Springs FTC is working on numerous species of fish, including threatened or endangered species. The program has expanded to include other aquatic species such as freshwater mussels and amphibians for conservation efforts.



Regional Office Visit to Warm Springs RFC. Cindy Williams displays a sicklefin redhorse held in the wetlab at the RFC (left). Chester Figiel, Jr. discusses salamander cryopreservation with Mark Musaus (right). Credit: USFWS Photos.

Conservation Genetics

The Conservation Genetics lab primarily works with biologists and managers of the region to design and implement genetic research on imperiled aquatic organisms.

Current Projects include estimating genetic diversity from: alligator gar, Gulf Coast striped bass, robust redhorse, freshwater mussels, and threatened and endangered species such as spotfin chub.

National Fish Strain Registry

The National Fish Strain Registry (NFSR) is an internet-based program that assembles information on life history, genetics, reproduction, and behavior of wild populations and domestic fish strains throughout the United States. The NFSR database is available for use by public and private producers as well as resource managers of federal, state, and tribal governments through a registration process. Once registered, users are able to search, create new records, edit records, and request information. The NFSR's vision is to provide a broad collaborative program that provides access to data and information on our Nation's aquatic resources. You must be a registered user to access the NFSR website; please contact chester_figiel@fws.gov or nicole_rankin@fws.gov to become a registered user.

Partnerships and Accountability

Regional Office Visit to Warm Springs



William talks about using the incubation trailer for cryopreservation studies.
Credit: USFWS Photo.

Mark Musaus (Deputy Regional Director), Bill Uihlein (Assistant Regional Director for Science Applications), Chuck Hunter (National Wildlife Refuge System Division of Planning Chief), Meredith Bartron (Northeast Fishery Center Population Ecology Branch Chief), Cindy Williams (R4 Fisheries Program Supervisor), and Joel Bader (Aquatic Animal Health National Coordinator) visited the Warm Springs Regional Fisheries Center on March 22, 2011. Project leaders gave short presentations explaining each of the Program areas: Fish Technology Center, Fish Health Center, National Fish Hatchery, and Outreach. William Wayman gave the presentation for the FTC which provided information about cryopreservation, conservation genetics, and the National Fish Strain Registry (NFSR).

During lunch, Chester Figiel, Jr. gave a presentation highlighting the NFSR, salamander cryopreservation, *Bd* chytrid surveys, and freshwater mussel age and growth work. Greg Moyer presented information about conservation genetics, more specifically ways the Conservation Genetics Lab can provide more genetics support for the region. Following lunch, the group was given tours of the facility and were given opportunities to ask questions about the programs. This visit provided a great opportunity for the group and staff to exchange ideas and start discussing future collaboration efforts.

Collecting Striped Bass Broodstock



Paul collecting a striped bass.
Credit: USFWS Photo.

Thanks to Brent Hess (GA Department of Natural Resources), Paul Jones (GA Department of Natural Resources), Devin Chappell (Fish Health Center), and Brian Hickson (Fish Health Center) for their assistance with collecting male striped bass broodstock on April 13 and 14, 2011. Chester Figiel, Jr. and Nicole Rankin also helped with electrofishing efforts and transported the broodstock back to station. The FTC conducted a tank spawning of striped bass study and needed additional male broodstock.

Leadership in Science and Technology

Refrigerated Storage and Cryopreservation of American Shad Sperm

On March 28, 2011, Mike Hassett and William Wayman traveled to Bears Bluff National Fish Hatchery outside of Charleston, SC to attempt to store and cryopreserve sperm from American shad. Experiments were conducted to determine a solution to allow refrigerated storage of the sperm. Results of the experiments allowed increased storage time compared to last year, but findings are still far from being sufficient for refrigerated storage. Results of the cryopreservation experiments were very encouraging. Post-thaw motility was fairly high compared to the motility at freezing. The development of a refrigerated storage technique should fully enable cryopreservation of sperm from American shad.

Leadership in Science and Technology

Tank Spawning of Striped Bass



William implants each female with hormones. Credit: USFWS Photo.

Domesticated striped bass were tank spawned during the first three full weeks of April 2011. A total of 21 females were implanted and setup with males each for spawning. Eighteen of the females spawned, and their eggs were incubated to determine their viability. Egg production and hatch rates are currently being calculated. During the third week of spawning, two wild males were introduced into each tank in an effort to increase the number of males in the spawning population and to increase the genetic diversity. Genetic analyses are being conducted to determine if these wild males contributed to the spawning effort. These males will be incorporated into the population and used in future spawning studies.

Larval Striped Bass Experiments

Corey Anderson, a graduate student from University of Southern Mississippi's Gulf Coast Research Laboratory, conducted experiments on larval striped bass in April 2011. Larval Gulf striped bass produced at the FTC were used to characterize yolk resorption timing and survival at near-lethal temperatures. Corey's research also includes estimating genetic heritability of thermal tolerance in Gulf striped bass larvae and assessing survival of phase I and phase II striped bass stocked into Mississippi coastal rivers using molecular tags to identify recaptured fish.



Checking the tag number.
Credit: USFWS Photo.

Cryopreservation of Striped Bass Sperm

Sperm were collected from domestic and wild striped bass at the FTC and cryopreserved in April 2011. The work is an effort to see if current cryopreservation techniques are capable of being used at a production scale. If possible, cryopreserved sperm could be used at production hatcheries during years when males are difficult to collect. The cryopreserved sperm will be used next year in fertilization trials to determine its effectiveness.

Blind Pony Pallid Sturgeon Sperm Cryopreservation

In an effort to preserve the genetic diversity of the endangered pallid sturgeon, sperm were shipped from Blind Pony State Fish Hatchery in Missouri to the FTC for cryopreservation on April 27 and 28, 2011. Sperm from 15 males were cryopreserved and placed in the pallid sturgeon sperm repository. This is the second year that sperm have been cryopreserved from middle basin fish, and this brings the number of middle basin males that have been cryopreserved up to 24. The work was partially funded by the U.S. Army Corps of Engineers.



Chester Figiel, Jr. cryopreserving sperm. Credit: USFWS Photo.

Aquatic Species Management and Conservation

Techniques Refined for Storing Alligator Gar Sperm



Jaci checks the sperm samples.

Credit: USFWS Photo.

In April 2011, Jaci Zelko traveled to Private John Allen National Fish Hatchery in Tupelo, MS to collect milt from several alligator gar broodstock for use in cryopreservation and short-term storage studies. The broodstock were wild fish captured from St. Catherine Creek in Sibley, MS and held at Private John Allen NFH during the spawning season. The development of cryopreservation techniques for alligator gar sperm continues in order to offset the small number of males that have been captured in the past several years. Jaci cryopreserved sperm from two males that will be added to the repository for long-term storage. Future efforts will include fertilization trials and refinement of cryopreservation techniques.

National Fish Strain Registry Updates

In March and April 2011, Nicole Rankin and Chester Figiel, Jr. updated the NFSR User Guide. The NFSR User Guide expanded to include more information about Creating and Searching for Strain Records. They also continued to work with Conservation Fisheries Inc. on incorporating captive propagation and translocation data of imperiled fishes, specifically the smoky madtom, slackwater darter, and diamond darter, into the NFSR. To learn more about the NFSR or obtain a user guide, please visit:
<http://www.fws.gov/warmsprings/nfsr>.

Public Use

Nicole Rankin participated in “Agricultural Week” at the West Point Georgia Visitors Center by providing a static booth that was displayed March 15 – March 20, 2011. Throughout the week, visitors could obtain information about the U.S. Fish and Wildlife Service, the Warm Springs Regional Fisheries Center (RFC), fish and fishing, and ways to improve your backyard habitat.

Pursuing Federal Jobs Presentation

Ashantye' Williams and Cindy Williams, R4 Fisheries Program Supervisor, traveled to Tennessee Tech University, Cookeville, TN during March 16 – 17, 2011. The University’s Student Fisheries Association graciously invited them to speak with the group on pursuing federal jobs. Cindy discussed job information in a presentation entitled “I Got A Degree, Now Give Me A Job!” During this hour long presentation, Ashantye’ shared her personal experience with obtaining a degree and the route she took in order to obtain her current position. Cindy was trying to promote to the students, especially minorities, that there are jobs for everyone. During the presentation, Cindy mentioned the importance of a good resume and the trials and tribulations of tackling the USAJOBS website. This visit was just one of several that Cindy and Ashantye’ plan in order to promote federal jobs for highly educated students. There is also hope to turn these presentations into a half day workshop at the American Fisheries Society annual meeting. The U.S. Fish and Wildlife Service is trying to reach out to college students to increase interest and expand the skill set for employees the USFWS wishes to hire in the future.

Public Use

Youth Ambassador Works During Spring Break

While other students vacationed during Spring Break, Cody Meshes worked three, full days at the Warm Springs RFC on April 4 – 6, 2011. At the start of the week, Cody assisted the FTC with tank spawning striped bass by carrying fish and recording tag numbers. In the afternoon, he along with Chester Figiel, Jr. and Nicole Rankin searched for new Piedmont blue burrower sites in Warm Springs, GA. On Tuesday, Cody gave a tour to some fellow students from Manchester High School. His classmates learned about the fish raised at the Warm Springs NFH and wild and hatchery fish health inspections conducted by the FHC. The group also learned about the FTC programs including cryopreservation, conservation genetics, and amphibian and freshwater mussel conservation. Later that day, Cody assisted the FHC with dissecting wild fish health survey samples from Kentucky. On Wednesday, Cody and Chester again went searching for new crayfish sites in Meriwether County, GA. Once again, Cody proved a valuable asset to the Warm Springs RFC. We appreciate his dedication and hard work during his break from school!. To read more about Cody and the other Youth Ambassadors in the 2010 Program, please visit the Youth Ambassador website: <http://www.fws.gov/southeast/youthambassadors/>.



Cody starts the tour at the Warm Springs aquarium. Credit: USFWS Photo.



Cody talks about freshwater mussel work. Credit: USFWS Photo.



Cody and Nicole searching for crayfish sites. Credit: USFWS Photo.

Greg Moyer conducted an Earth Day program at the LaGrange Montessori School, GA for 45 preschoolers and teachers on April 18, 2011. He talked to the students about the importance of aquatic species and habitat conservation. He brought turtles, crayfish, salamanders, and an American alligator for the students to observe and touch. Overall, the preschoolers and teachers really enjoyed the visit!

Fort Benning Earth Day Fair



Nicole talks about aquatic species conservation. Credit: USFWS Photo.

The Warm Springs RFC and Fort Benning Ecological Services Office (FBESO) participated in the 2011 Earth Day Festival at Faith Middle School on Fort Benning, GA on April 21, 2011. More than 500 children and teachers from the seven Fort Benning schools learned about the U.S. Fish and Wildlife Service Fisheries Program, aquatic species biology and conservation, and environmental stewardship. Nicole Rankin, Allison Hernandez (FHC), and Sandy Spivey (FBESO) handed out educational materials, explained fisheries restoration in regards to lake sturgeon, and manned the touch tank filled with crayfish, salamanders, and turtles.